

## Section 2. Critical Lands Defined

This section provides a categorization of critical lands, as well as a background description of each land type as a reference to the digital maps available on the County's website at [www.utah.gov](http://www.utah.gov). The data attributes and sources are listed in the Appendix. The background information provided in this section and the data attributes listed in the appendix are to be used as a companion guide to the automated mapping reports generated on the Critical Lands website.

Critical lands can be categorized into three main groups as they relate to public welfare: The first category is a grouping of land features with characteristics or vulnerabilities that pose a risk to the life, health, and safety of county residents:

### Category 1. Public Health and Safety

- a. Geologic Hazards
  - a. Landslide
  - b. Rockfall
  - c. Flooding record (10,000 years)
  - d. Earthquakes
- b. FEMA flooding data
- c. Erosion prone soils hazard
- d. Wildfire Risk

The second category includes land areas that enhance the local or regional quality of life, including aesthetic, cultural, and recreational interests:

### Category 2. Quality of Life (Public Interests)

- a. Agricultural Land
- b. Viewsheds, Ridge Lines
- d. (Riparian) – habitat, fishing, recreation, clean water etc.
- e. Scenic Byway

The third category may indirectly relate to public health and safety, or to Quality of Life interests, and focuses directly on important wildlife habitat areas in Washington County. One goal of this section is to promote understanding of how negative impacts to federally listed species can be diminished, and to assure that federal regulations do not require additional control over local governance of private land.

### Category 3. Wildlife Habitat

#### 3a. Threatened and Endangered Species

Listed species in Washington County include: The Desert Tortoise, Mexican Spotted Owl, Southwestern Willow Flycatcher, Yellow-Billed Cuckoo, Virgin River Chub, Woundfin, Dwarf bear-claw poppy, Shivwits milkvetch, Homgren milkvetch, and Siler pincushion cactus.

#### 3b. Critical Habitat for Large Ungulate Species

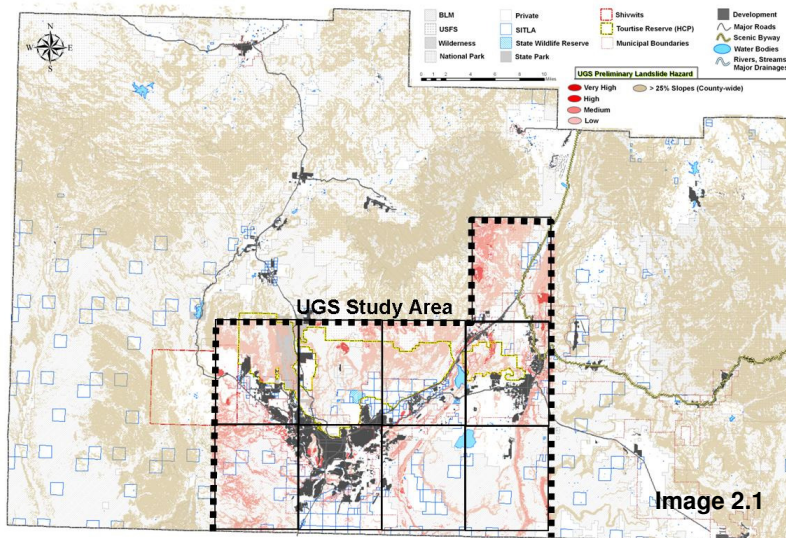
Mule Deer, Elk, and Bighorn Sheep migrate over large landscape areas that also provide habitat for many additional plant and animal species.

## Category 1. Public Health and Safety

### Geological Hazards

The Utah Geological Survey is an applied scientific agency that creates, interprets, and provides information about Utah's geologic environment, resources, and hazards to promote safe, beneficial, and wise use of land.<sup>1</sup> Washington County is fortunate to have recent geologic-hazard data for a significant portion of the St. George metropolitan region. This data includes geologic mapping and geologic-hazards information for nine United States Geological Survey quadrangles where growth pressures are most imminent in the St. George area. The UGS also has provided an interactive mapping utility that

generates geologic-hazard reports for specific areas of interest, such as land parcels, corridors, or planning areas. The UGS could expand the study of these natural hazards into other areas of the county where growth pressures are also mounting. Funding from local governments can expedite these studies and the creation of new data for planning purposes throughout the county.



Four categories of risk are represented, including a detailed delineation of active faults; two ground-movement hazards, including landslides and rock falls; and flooding and debris flows. Although the study area is limited (366 square miles), the landslide data corresponds strongly to the surrounding steep slope data shown throughout the county. This implies that slopes greater than 25% generally pose a greater risk of landslide, rock-fall, or debris-flow hazards, and merit additional study to determine slope instability associated with geologic substrate materials.

The data provided by the UGS does not imply that all hazard areas should remain undeveloped. Rather, the data are intended to make developers, planners, engineers and elected officials aware of potential hazards and to indicate where further study and mitigation measures are warranted. Site-specific geotechnical studies may prove that hazards are absent or can be mitigated to avoid posing undue risk to the public.

The potential for a variety of landslide hazards poses a threat to any development that may be built on or down slope from unstable areas. Access roads that pass through sensitive slope areas are also at risk of damage, which could cut off vehicle and emergency services as well as sewer and water line services to developed areas.



Three major types of slope failures are common in Utah, including debris flow, sliding, and rock fall:

<p><b>Debris Flow</b></p> <p>Source Area</p> <p>Deposit</p>	<p><b>Slide</b></p>	<p><b>Rock Fall</b></p>
<p>Image 2.2a: Debris flows are often a result of flooding where sediments and larger debris are deposited along streams, drainages or slopes.</p>	<p>Image 2.2b: Landslides are the downward movement of soil or rock substrate material – typically occurring on steeper slopes.</p>	<p>Image 2.2c: Rock fall from cliffs or steep slopes can be suddenly triggered by snow melt, erosion from rainwater, or seismic activity.</p>



**Debris flows** from slopes or drainages pose a risk to development that lies down path from unstable surface materials during high precipitation events or periods of extremely rapid snowmelt. Debris-flow hazard can be reduced by managing wild fires, or grazing that may occur up slope from development. Removing vegetation from slopes, whether from over-grazing, wildfire, or development can increase the hazard of debris flow. Even without human disturbances, debris flows can occur when triggered by abnormal

rainfall or snowmelt. The UGS geologic data shows that young debris-flow deposits are common in some areas of Washington County. The presence of these young deposits indicates that additional debris flows should be expected in the future. Mitigation measures to reduce debris-flow hazard may include revegetation, building debris flow dams at drainage outlets, or preserving open space corridors that correspond with known debris-flow paths.



**Landslides** may be triggered by earthquakes, but other typical causes of landslide include ground-water buildup or ground saturation from excessive spring runoff or irrigation. Existing landslides in Washington County demonstrate the need to carefully consider the geologic substrate of slopes that may be disturbed by development, or saturated by irrigation.

A landslide was triggered by the 1992 St. George earthquake between Springdale and Zion Nation Park. This event also sent rocks falling onto S.R. 9, and created an escarpment as the hillside slid downward throughout the day. The slide moved about 30 feet to the east, cutting off power to north Springdale and the park and destroying three homes, two water tanks, a number of out buildings,





and utility lines. Additional homes and businesses were evacuated for fear of after shocks causing additional sliding.



This image of the Truman Drive Slide from 2003 required the condemnation of two homes by Santa Clara City, and abandonment of the road. The landslide started creeping in the early 80's after road excavation and construction, and began moving more rapidly in 2002. Pillars in the image are part of a failed caisson (an underground concrete pier) wall designed to protect the back lot from landslide enlargement. The landslide occurred on blue clay on moderate to steep slopes.



**Rock-Fall Hazard** – is a risk for areas below steep slopes where the forces of nature loosen exposed bedrock on mesa, plateau, or cliff faces. Forces of wind, rain, erosion, freeze-thaw, and earthquakes loosen rocks and gravity propels them downslope. Similar to landslides, a strong correlation exists between rock-fall hazard areas and slopes greater than 25% (see online mapping utility). Image 2.6 shows a large rock that destroyed half of a home in Rockville in 2002. Home buyers should be aware that most homeowners insurance policies may cover landslides, but do not usually cover rock-fall damage. Collecting insurance coverage payments for this specific natural disaster may require a battle with the contracted insurance company, as was the case in the 2002 Rockville rockfall.



Image 2.7 is a rock-fall photographed outside of Las Vegas, Nevada. The rock shattered on ground impact, with large boulders rolling up to 100 feet on relatively flat ground from the steep slope base.

Of the three types of geologic slope hazards described above, landslides in particular can be triggered by slope disturbance from the development of roads, infrastructure, buildings, or irrigation. Some of the most common causes of landslides include:

1. Saturated soils on slopes: from heavy rainfall, rapid snowmelt, consecutive wet seasons, agriculture or landscape irrigation, roof downspouts, poor drainage, septic-tank effluent, canal leakage, or broken water or sewer lines.
2. Slope Disturbance: grading that cuts into the toe of a slope, adding material to the top of a slope, or excavation that cuts into slopes for new roads or structures.

3. Earthquakes: shaking of the earth can trigger failure of unstable slope areas, such as the 1992 Springdale landslide.
4. Erosion: landslide activity that results from water scouring soil and substrate material from the base of a slope.

**Landslide Prone Areas include:**

1. Existing landslides.
2. Steep natural slopes, particularly in weak geologic materials.
3. Steep construction-related cut or fill slopes.
4. Areas in or at the mouths of steep drainages (such as canyons).
5. Slopes below leaking canals or ponds.
6. Developed hillsides where septic-tank soil-absorption systems are used and landscapes are irrigated.
7. Below cliffs or hills with outcrops of fractured rock.

**Earthquakes**

The UGS study also delineates potentially active faults capable of generating earthquakes within the nine quadrangle study area. Earlier fault data is also available for the entire county, although the locations are not as accurate. In general, faults are less active in the north and western portions of the county, and more active in the south and eastern areas.

The Utah Geological Survey (UGS) recently released Special Study 119, *Paleoseismic Investigation and Long-Term Slip History of the Hurricane Fault in Southwestern Utah*, which provides critical earthquake information such as timing, recurrence, and size of large surface-faulting earthquakes along the Hurricane fault. This report is part of a more extensive cooperative study of the Hurricane fault in both Utah and Arizona by the UGS and the Arizona Geological Survey. The study was funded by the U.S. Geological Survey through the National Earthquake Hazards Reduction Program and by the States of Utah and Arizona.

Site-specific study of active faults can suggest an appropriate buffer to separate buildings and infrastructure from potential areas of ground rupture during earthquakes. Additionally, cliff faces along fault lines, and steep slopes above or below faults present rock-fall and landslide hazards during earthquakes. The likely path of landsliding should be considered when siting homes, businesses, and infrastructure facilities.

For additional information, UGS provides a “Homebuyer’s Guide to Earthquake Hazard’s in Utah,” available online at <http://geology.utah.gov/online/pdf/pi-38.pdf> and an “Earthquake Fault Map of a portion of Washington County,” available at <http://geology.utah.gov/online/pi/pi-85.pdf>.



## **Flooding and Erosion**

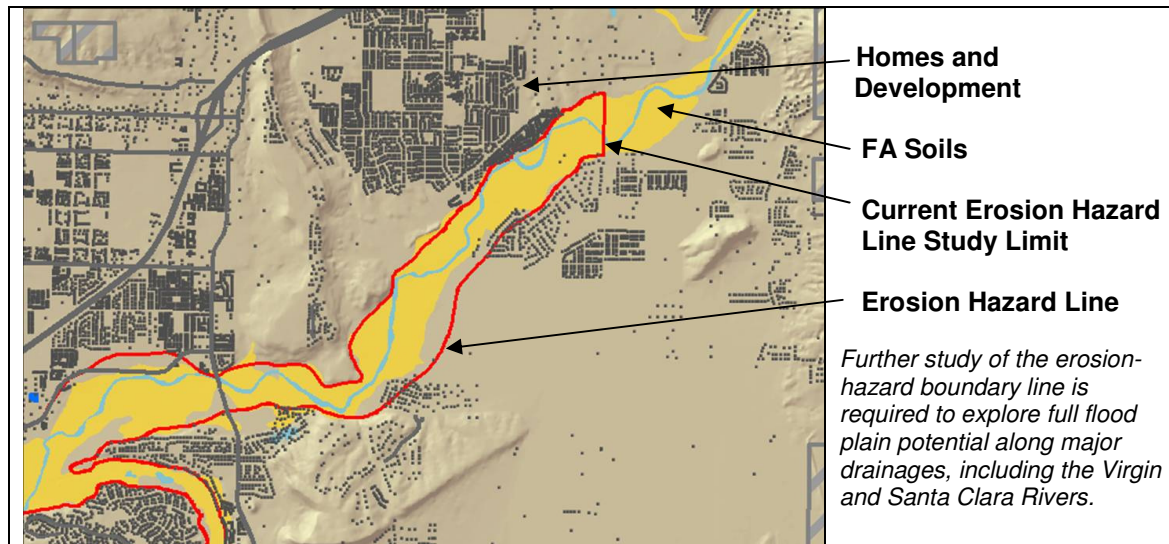
Four sets of map data are provided to show areas that are at risk for torrential flooding, bank erosion, and flash flooding. These include 1. Erosion hazard boundaries along portions of the Santa Clara and Virgin Rivers, 2. Erosion prone soils near the same major water bodies, 3. Draft FEMA flood-plain areas near major rivers, and 4. Washington County water ways and drainages, including perennial rivers and streams, intermittent streams, and ephemeral drainage washes.

### **1. Erosion Hazard Boundary**

Much of the damage from the flooding of 2005 occurred within flood plains that were not well documented. Flood plains were previously considered to only be low lying areas along rivers subject to flood inundation. Flooding in 1997 and again in 2005 revealed the potential for rapid erosion of river embankments by high velocity flood waters. Following the floods in 1997, a local government partnership commenced to delineate areas of erosion prone soils near high-risk flood zones – referred to as the erosion hazard zones. Some areas of this study have been completed, revealing homes and infrastructure that were built on susceptible soils. More funding will allow scientific study of waterways, soils, and geologic formations to progress throughout the entire county. The study will continue to provide the boundary that marks erosive soils near flood-prone rivers that could fail when subjected to high velocity flood waters.

### **2. Erosion Prone Soils**

To show the soil erosion potential beyond the current FEMA 100-year flood-plain and erosion-hazard zone maps, a unique soil type is included in the digital map that shows county-wide alluvial riverwash deposits that are considered by the Natural Resource Conservation Service (NRCS) to be subject to flooding and not suitable for development. The soil type is called (FA) – Sandy Fluvaquents and Torrifluvents. This soil type indicates flood-plain areas where the river once meandered, and where it could flow again. A new river alignment may occur gradually over decades, or develop suddenly during a catastrophic flood.





### Federal Emergency Management Agency **Flood-Plain Mapping**

Local government officials and stakeholders have worked through the Utah State Department of Public Safety - Division of Homeland Security, to update Federal Emergency Management Agency (FEMA) flood-plain maps. Once completed, these maps will provide a reference for real estate agents, homeowners, and lenders to identify homes that may require FEMA flood insurance. This new data is currently in draft form, and is viewable on map serve.

Designated FEMA flood-plain areas are not an exhaustive record of all flooding potential throughout the county. FEMA data shows flooding potential near major drainages that constitute higher risk flood and erosion areas. These flooding categories are listed by level of severity, from 100 Year Floodway (flooding and erosion potential), 100 Year Flood Plain, Sheet Flow (1' to 3' Deep), and 500-Year Sheet Flow (less than 1').

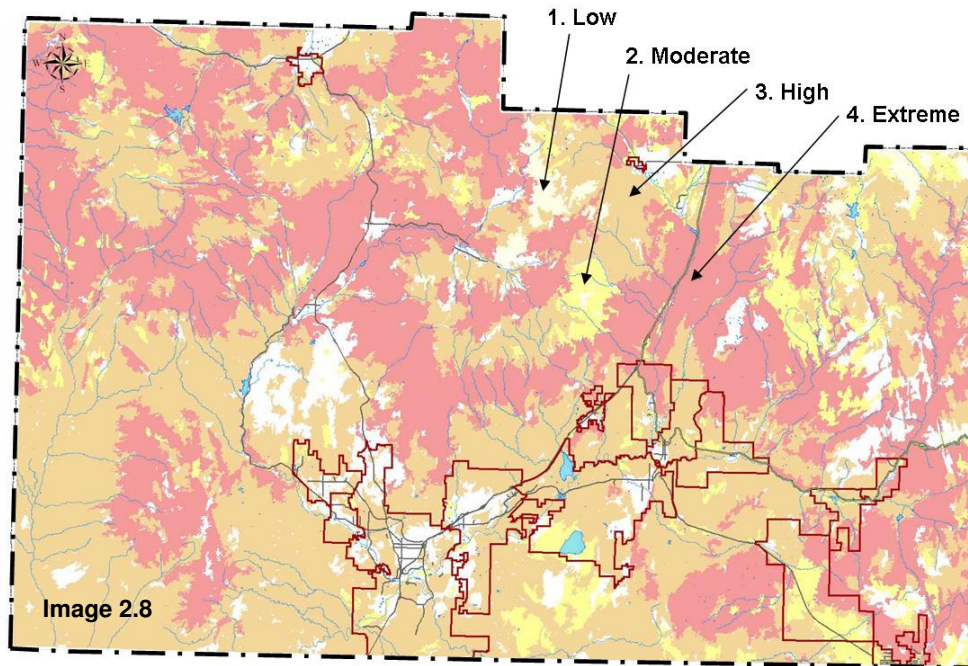
**Flash-Flood areas** typically occur in intermittent creek beds or ephemeral washes that drain from higher elevations into perennial streams and rivers. Washes, and rivers are all prone to flash flooding during major rainfall events. Potential flash-flooding areas along intermittent streams and dry bed drainages are shown as dashed blue lines in the online mapping utility. Depending on the slope, vegetation cover, and rainfall intensity, these drainages bear strong potential for spring flooding, flash flooding, and resulting debris flows during heavy rains and spring snow melt.

These drainages should be compared to UGS flood-hazard areas determined by the distribution of alluvial (water deposited) sediment. Communities may wish to consider further protection of the public from flooding and erosion hazard by considering these additional risks.



### **Fire Hazard Risk**

The Utah Statewide Fire Assessment Project is a recent study developed in partnership with federal and state agencies that provides mapping data that suggests where potential fire threats pose the greatest hazard to home owners and the public. The purpose of the data is to provide a strategic look at fire potential based on the presence of vegetation fuel loads.



The fire hazard potential is largely based on plant communities, displayed as digital vegetation mapping data that was derived from Land Satellite imagery by Utah State University. Also considered in the rating are slope conditions, and the expected wood fuel behaviors in a fire event including intensity levels, resistance to control, and rates of spread based on experience with each vegetation type in Utah. Fire hazard level ratings were classified into four levels (see fire hazard potential map, above), including extreme (red), high (orange), moderate (yellow), and low (tan). The analysis is based on a representation of overstory vegetation at the statewide scale, and does not consider dead and down fuels or understory vegetation that might act as ladder fuel (ref). In general, plant communities with contiguous coverage of woody tree and shrub forest coverage present a higher fire hazard rating due to the increased fuel load, and potential for fire to burn hotter and longer. The data is to be used for general strategic planning purposes, and to inform additional tactical planning that should occur for urban wild-land interface planning and development review processes.<sup>2</sup>

The Five County Association of Governments completed a regional Wildfire Protection Plan in 2007. The plan lays out strategies for wildfire protection efforts. It can be accessed at: <http://www.fcaog.state.ut.us/wildfire.htm>





## ***Threatened and Endangered Species***

Washington County's extraordinary landscape is home to a number of threatened and endangered wildlife and plant species listed under the Endangered Species Act (ESA) of 1973. The U.S. Fish and Wildlife Service carries out the mandate ESA, which is designed to protect imperiled species from extinction due primarily to growth and resulting habitat loss. The decline of a plant or animal species can signal the diminished health and value of the natural environment in which the species lives, and that supports communities where people live and enjoy clean water, air, or recreational open space.

The flora and fauna throughout Washington County contributes to the aesthetic quality of the regional landscape. If sufficiently protected, strategic conservation efforts can support threatened and endangered species recovery programs and prevent additional species from being listed. Local initiatives to preserve critical habitat areas can ensure that direct federal oversight of local development growth management policies is avoided. The following summary describes key ESA policies, and outlines the recovery goals for each species at risk in Washington County. The purpose of this summary is to increase public awareness, and to encourage cooperation between land owners, local governments and federal land agencies as they focus on recovery of listed species in Washington County.

Listed species in Washington County include the following (Threatened = T, Endangered = E or Considered Status = C):

### **Animals**

- The Desert Tortoise (T)
- Mexican Spotted Owl (T)
- Southwestern Willow Flycatcher (E)
- Yellow-Billed Cuckoo (C)
- Virgin River Chub (E)
- Woundfin (E)

### **Plants**

- Dwarf Bear-Claw Poppy (E)
- Shivwits Milkvetch (E)
- Holmgren Milkvetch (E)
- Silver Cholla Cactus (T)

## **ESA Critical Habitat and Conservation Provisions:**

Restoring and endangered or threatened animal or plant to the point where it is again a secure, self-sustaining member of its ecosystem is a primary goal of the Service's endangered species program. Under the ESA, the Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA) are required to create Recovery Plans for each species outlining goals, tasks required, likely costs, and estimated timeline for recovery for each species.<sup>3</sup>

Critical habitat areas are not a preserve or refuge, but are rather designated geographic regions that are considered essential for conservation of habitat for a particular plant or animal species. With limited exceptions, the ESA requires that critical habitat be designated for all listed species, encompassing all lands and waters "essential to the conservation of the species" (sec.3[5][A]). "Conservation" is defined as all actions necessary to fully recover and delist species (sec. 3[3]). Federal agencies are prohibited from authorizing, funding, or carrying out actions that are likely to "destroy or adversely



modify” critical habitats (sec. 7[a][2]). This prohibition also applies to state or private actions that require federal permits, such as Clean Water Act permits for significant development, mining, logging or cattle operations and the approval of habitat conservation plans by the USFWS and NMFS.<sup>4</sup> However, on city, county, state or private land, where no Federal involvement exists, a critical habitat designation has no regulatory impact.<sup>5</sup>

Under Section 9, it is a criminal offense for any person, including Federal agency personnel, to “take” an endangered fish or wildlife species. The Secretaries of Interior and Commerce have defined “take” to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. It also makes it unlawful for any person to attempt to commit, solicit another to commit, or cause to be committed, any offense defined in the ESA.<sup>6</sup>

However, Section 9 does not provide this same level of protection to plants located on private lands. Specifically, the ESA states that it is unlawful to remove and reduce to possession, or maliciously damage or destroy any endangered species of plants from areas under Federal jurisdiction.<sup>7</sup>

If there is no federal involvement, and no Habitat Conservation Plan (see below) in place, it is recommended that a private landowner in an area designated as critical habitat contact federal or state officials prior to development. This would allow for the protection of the species as well as the land owner. If a landowner knowing or unknowingly “takes” or kills a species, he/she may be subject to violations and penalties under Section 11.

Section 11 describes the violations and penalties that may be enforced under the law. The most punishable offense is enforced on those who knowingly break the law, and may subject to up to \$50,000 penalty and or imprisonment for up to one year. Fines are based on the degree and number of violations that one has committed. One may also lose any licensing, permits or other agreements authorized by a federal agency, and lose any hunting or fishing permits issued.

### **Habitat Conservation Plans**

In 1982, Congress amended Section 10 of the ESA to authorize “incidental takings” through the development and implementation of Habitat Conservation Plans or HCPs (See the Red Cliff’s Desert Reserve below). An incidental take permit allows a property owner to conduct otherwise lawful activities in the presence of listed species. A non-federal entity must develop an HCP in order to apply for an incidental take permit. The HCP integrates the applicants proposed project or activity with the needs of the species. It describes the anticipated effect of a proposed taking on the affected species, and how that take will be minimized and mitigated.<sup>8</sup> In the case of the Red Cliffs Desert Reserve in Washington County, the HCP was developed by local communities, setting aside 62,000 acres of protected habitat designated by the HCP, allowing development on otherwise designated critical habitat outside of the Reserve. One continuing issue of concern is that the HCP committed to acquire all private and state school trust lands within the Reserve, which has not been possible to date due to difficulty in implementing land exchanges and purchases.

## Washington County Endangered Species

### Desert Tortoise

The desert tortoise (*Gopherus agassizii*) is a species of tortoise native to the Mojave desert and Sonoran desert of the southwestern United States and northern Mexico. Due to significant population decline, the United States Fish and Wildlife Service listed the Desert Tortoise populations in the Mojave Desert as a threatened species in 1990. This listing affected areas in Utah, Arizona, Nevada, and California.

The Desert Tortoise faces several threats, including: urbanization, habitat destruction and fragmentation, illegal collection and vandalism, and competition with cattle for forage plants. However, perhaps the biggest risk facing the Desert Tortoise recovery effort is now the increased risk of wild fire with the rapid spreading of cheat grass. Even if a Tortoise escapes a fire by hiding in the shelter of an underground burrow, destroyed plant life could cause starvation of survivors. Biologists estimate there was a 40 percent to 50 percent mortality rate for desert tortoises in burned areas in southern Utah. Seventy-percent of those that survived preferred to relocate to unburned areas. Fires burned 25 percent of the habitat in Red Cliffs Desert Reserve, an area in southwestern Utah that was established in 1996 for desert tortoise habitat.<sup>9</sup>

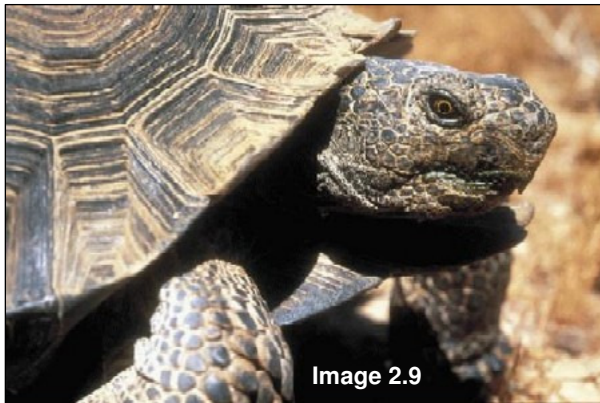


Image 2.9

To avoid continual federal oversight and regulation of local land development policies, the Washington County “Red Cliff’s Desert Reserve” was created in partnership with multiple land agency, local government, and land trust partners to serve as a Habitat Conservation Preserve (HCP). The preserve covers 62,000 acres next to the rapid growth of the St. George metropolitan region, and includes Snow Canyon State Park. The HCP defines a specific land area to be protected and

managed for tortoises that are relocated from proposed development sites elsewhere in the county.

Since the inception of the HCP in 1996, over 256 tortoises have been transferred into the reserve. “The reserve was established in 1996 to protect a large, diverse, and functional expanse of habitat capable of sustaining wildlife populations threatened by rapid development and habitat loss across Washington County in southwestern Utah. Located immediately adjacent to several growing communities, the reserve also protects the cities’ scenic red rock backdrop and an increasingly popular area for scenic and recreational activity.



Another significant region of Desert Tortoise habitat is located on 48,519 acres of federal BLM lands located in the southwest corner of the county. The area is designated as an “Area of Critical Environmental Concern (ACEC)” a designation that demands special BLM focus and management to protect unique natural values, or to protect human life and safety from natural hazards. This region serves as an additional preserve to help Desert Tortoise flourish and recover to a more stable population.

## Mexican Spotted Owl



Image 2.10

The Mexican spotted owl is found between central Mexico to the south, and as far north as southern Utah and Colorado in canyon and mountain forest areas. The owl was listed as threatened by the Fish & Wildlife Service on March 16, 1993 (58 FR 14248). The Mexican spotted owl is threatened by the loss of old growth forests (its preferred habitat) throughout its range, starvation and fire. They are also affected by Barred Owl encroachment, great horned owl predation, low reproductive success and low juvenile survival rates.

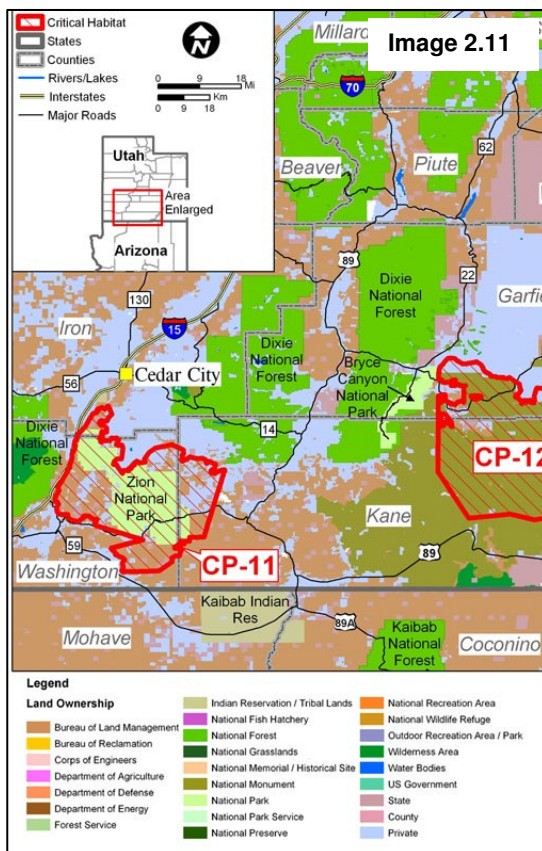


Image 2.11

Following its designation, 4.6 million acres of Federal Lands were identified as critical habitat in Utah, Arizona, Colorado and New Mexico. The image at left shows critical habitat unit CP-11 – which covers the region surrounding Zion National Park in Washington County, and parts of Iron and Kane Counties.

The Mexican Spotted Owl Recovery Plan does not claim that all areas within the habitat unit are critical to the owl, and, private land areas within a general critical habitat region are not included in the designation. Physical and biological features required for the species' survival require field observation on federal lands, refined mapping, or other consultation.<sup>10</sup>

The online mapping utility shows the most likely areas within the critical habitat unit that would provide habitat for the Spotted Owl. These areas are based on new predictive habitat data from Utah State University for



the spotted owl, based on vegetation type, slope aspect, or other features. This interpretation of spotted owl habitat shows the majority of predicted on Federal lands (National Park and BLM), and a much smaller portion extending onto private land holdings. The county could encourage cluster development patterns or transferable development right incentives to preserve important habitat areas within the critical habitat unit to support full species recovery (See Implementation Section 4).

### **Southwestern Willow Flycatcher**



Image 2.12

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a small Neotropical migratory bird, with a grayish-green back and wings, whitish throat, a light grey-olive breast, and a pale yellowish belly. The flycatcher's nesting habitat consists of trees and shrubs along riparian corridors associated with rivers, swamps, wetlands, lakes and reservoirs. These riparian ecosystems provide nesting cover, and access to feed of insects and seeds that are abundant near water.

The USFWS proposed to list the flycatcher as an endangered species in 1993 with 643 miles of riparian habitats proposed for critical habitat designation. The species was designated as endangered on March 29<sup>th</sup>, 1995 with 599 miles of riparian habitats.

The southwestern willow flycatcher's historic range includes riparian corridors in southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and northwestern Mexico. Like the majority of southwestern rivers, the quality of riparian vegetation along the Virgin River and its tributaries has suffered greatly over the past century and a half from agriculture, urbanization, dams, and water diversions. Water flows and health of riparian vegetation support many other species of birds, fish and mammals in Washington County. The Virgin River Basin is reported to support 32 species which are globally rare and of pressing conservation concern (According to the Natural Heritage Programs in Utah, Arizona, and Nevada). The USFWS lists six of these species as endangered; two more are threatened and an additional 24 are being monitored. Many of these species rely on the Virgin River's riparian habitat which occurs on only 1% of the entire Basin's land base.<sup>11</sup>

Federal management of riparian vegetation to support the fly catcher and other sensitive species is limited due to the Core of Engineer's lack of jurisdictional control above the high water mark elevation. The vegetation line of southwestern rivers is often above the high water line, and often does not meet the definition of jurisdictional wetlands of the United States.

## Yellow-Billed Cuckoo



The Yellow-Billed Cuckoo (*Coccyzus americanus*) is a medium-sized bird of about 12 inches in length with grayish-brown and white plumage, a long slender tail, and a dark blue bill that is slightly down-curved with yellow on the basal half. The Cuckoo was petitioned for federal listing in 1998, and remains a candidate to this day. Cuckoo populations have dropped dramatically in the western United States where the distribution and quality of the bird's riparian habitat has decreased. The Fish and Wildlife Service is likely to list the Yellow-Billed Cuckoo, but is currently focusing program funding on listings that must be addressed to comply with court orders and judicially approved settlement agreements.<sup>12</sup>

Migrating Yellow-billed cuckoos arrive in Utah in May or early June, and breed into July in lowland riparian habitats. They migrate to tropical forests in northern South America starting in late August or early September. The cuckoo requires healthy riparian habitats that comprise of large tracts of cottonwood and willow, with dense under stories of shrubs and grasses found between 2,500 ft to 6,000 ft in elevation. It is thought that the bird's nesting behavior also depends on food abundance, feeding on large insects such as caterpillars, grasshoppers, cicadas, beetles, and katydids found in tree and shrub foliage, and even lizards, frogs, and eggs of other birds.<sup>13</sup>

Threats to the Cuckoo's habitat include invasive species such as Tamarisk, dewatering, grazing, agriculture oil and gas development, and recreation overuse next to healthy vegetation stands.<sup>13</sup> All of these factors could be properly managed to preserve and encourage new riparian trees and under story to support the Cuckoo and other riparian obligated species.

## Woundfin, and Virgin River Chub

The Fish and Wildlife Service has listed two species of fish as endangered that are native to the Virgin River watershed, including the Woundfin (*Plagopterus argentissimus*) listed on October 13, 1970 (35 FR 16047), and the Virgin River Chub (*Gila seminuda*) listed as endangered on August 24, 1990 (54 FR 35305).



The woundfin is a minnow with a flat head, silvery color, and it possesses a sharp dorsal spine that inspired its common name. The head and belly of the woundfin are flat, which creates a torpedo shape that is suited for maneuvering in swift streams or rivers, including shallow waters and sandy river bottoms. Once abundant in Virgin River tributaries, the Woundfin have vanished from much of their historical range except for the mainstem

Virgin River. The fish usually inhabit runs and quiet waters adjacent to riffles, as well as slow flowing stream edges that may include dense growths of filamentous algae.<sup>14</sup>



The Virgin River chub is a silvery medium-sized minnow that averages about 8 inches in total length but can grow to a length of 18 inches. Chubs are found in deep runs or pool habitats of slow to moderate velocities with large boulders or instream cover, such as root snags.<sup>14</sup>

The principal threats to these two species include stream flow alterations from dams, reservoirs and diversions, canals, laterals, aqueducts, and the resulting stream flow losses that degrade river bed habitat quality. Other contributing factors include decreased water quality, and the introduction and proliferation of nonnative fish species. The recovery plan suggests that downlisting from endangered status to threatened status may occur when the Virgin River flow volumes are sufficiently regulated to sustain aquatic habitats, and when nonnative fish species are eliminated or sufficiently reduced. The red shiner is the most abundant of introduced fish species to the Virgin River. Red shiners compete with the Woundfin for limited food and livable river habitat, and possibly predation on larvae.<sup>14</sup>

The BLM initiated Habitat Management Plans on several sections of the Virgin River. These plans emphasize habitat requirements for the woundfin and the chub, and guide efforts to manage and maintain resources of the Virgin River Valley. In 1982 the Fish and Wildlife Service submitted a biological opinion for the Quail Creek Reservoir Project, which led to the Washington County Water Conservancy District funding a 5-year study of the distribution and habitat use of native fishes in the Virgin River in Utah. This effort also resulted in the establishment of the Virgin River Fishes Data Base at USU, which contains known collection data on the fishes within the Virgin River since 1976. This data base is updated each year as part of ongoing recovery efforts.<sup>14</sup>

**Shivwits milkvetch (*Astragalus ampullarioides*),**

**Holmgren milkvetch (*Astragalus holmgreniorum*)**

The Shivwits and Holmgren Milk-vetches are members of the pea family, and are found in portions of Washington County, Utah and Mohave County, Arizona. Both species grow on state and private lands, as well as land managed by the BLM.

The Shivwits milk-vetch is found only in southern Washington County, and is also found at Zion National Park and on Tribal lands belonging to the Shivwits band of the Paiutes. The Holmgren milk-vetch is usually found on edges of hill and plateau formations, slightly above or on the edge of drainage areas. These native plants were listed as endangered in October 2001 due to their rarity and declining population trends. Threats to these two species include urban development, off-road vehicle use, grazing, invasive non-native plants, and mineral development.<sup>15</sup>

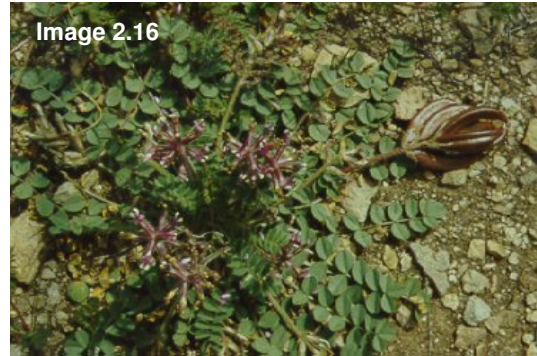


Image 2.16



Image 2.17

The U.S. Fish and Wildlife Service completed a final recovery plan for the Shivwits and Holmgren Milk-vetches in the fall of 2006. The recovery plan is voluntary document rather than binding, and promotes voluntary conservation efforts and cooperation between federal and state agencies, and land owners. The recovery plan identifies specific actions that will help recover the plants so that they may be downlisted to threatened and eventually removed from the list of threatened and endangered species.

Recommended actions include:

- Ensuring the habitat base for each recovery population is large enough to allow for natural population dynamics, population expansion where needed, and the continued presence of pollinators, with sufficient connectivity to allow for gene flow within and among populations;
- Achieving permanent land protection for at least four recovery populations;
- Developing site-specific conservation agreements for all recovery populations and their habitat to protect the milk-vetches within existing State laws;
- Prohibiting the use of pesticides or herbicides detrimental to either of the milkvetches or their pollinators with the vicinity of all recovery populations; and
- Collecting and storing seeds for all extant populations<sup>16</sup>



### Dwarf Bear Claw Poppy (*Arctomecon humilis*)



Dwarf bear claw-poppy, *Arctomecon humilis*, is a Federally listed endangered plant that is found only in Washington County, Utah. A member of the poppy family, this species is a perennial herb that produces abundant white flowers. The flowers bloom from mid-April through May, and are quite showy next to the red soils in which the plant grows. Dwarf bear claw-poppy is found on gypsiferous clay soils derived from the Moenkopi Formation. It occurs on rolling low hills and ridge tops, often on barren, open sites in warm desert shrub communities, at elevations ranging from 700 to 1402 meters. The species' habitat is in an area of rapid population growth, and the low barren hills on which the dwarf bear claw poppy grows are impacted by development and off-road vehicle use.<sup>17</sup>

In addition to serving on the Washington County Desert Tortoise Steering Committee in the early 90's, The Nature Conservancy (TNC) has also worked to protect the dwarf bear claw poppy – a rare species listed as Endangered by the US Fish and Wildlife Service. This showy, white-petaled wildflower is now known to exist in only 7 small populations in the St. George area – and nowhere else on earth. Several years ago, The Nature Conservancy purchased a 17-acre parcel containing the only dwarf bear claw poppy population that occurs on private land. In 2007 TNC purchased an additional 55.52 acres of dwarf bear claw poppy habitat with plans to purchase another 600 acres over the next few years – all to be established as a nature preserve with public access. On all properties they will continue to study and monitor this rare and beautiful wildflower.

### Siler pincushion cactus (*Pediocactus sileri*)

The Siler pincushion cactus is on the Federal list of threatened plants. Its areas of distribution are limited to Kane and Washington Counties in Utah, as well the bordering counties of Coconino and Mohave in Arizona. Although size can vary, this small primarily solitary cactus stands approximately 13.5 cm (5 in) tall and 7.6-10.0 cm (3-4 in) in diameter. Identified by its yellow flowers with purple veins that bloom during March and April, the cactus is found in desert scrub habitat at elevations ranging from 2,800 to 5,400 feet on the white occasionally red gypsiferous clay or sandy soils of the Moenkopi Formation. It may also be found on the nearly identical Kaibab Formation. This species is vulnerable to threats because of its specific habitat requirements. Threats include illegal collection, herbivory by an unknown animal (possibly a species of rodent), uranium mining and exploration, off-road vehicle disturbance, and pesticide application.<sup>18</sup>



### **3a. Critical Habitat for Large Ungulate Species**

Mule Deer, Elk, and Bighorn Sheep species are well known animals that are popular for hunting, wildlife viewing and photography. Although many other wildlife species could be included in this inventory of wildlife habitat, the presence of larger ungulate (hoofed) animals can serve as an indicator of habitat health for many other species.<sup>19</sup>



Mule Deer are found in the western half of the United States, and are able to adjust to a range of habitat types – from open deserts to high mountains - with some that even adapt to urban areas. Mule deer eat shrubs, grasses, and other woody materials such as sage brush. Despite the tolerance of many different habitat types and diet choices, local mule deer populations are reduced or eliminated when critical winter habitat is replaced by land development. Deer depend on southwest facing lower elevation slopes during winter months where snow melts quickly and food sources can be found. Also important to deer are preserved corridors to migrate from winter areas to higher mountain summer foraging areas. Mule deer mate in the late fall, and does give birth to one or two fawns in the late spring or early fall.



Similar to mule deer, the elk (also called wapiti) are drawn to mountain foraging areas in forests and meadows during summer months, and seek lower elevation foothills during the winter. Access to lower elevation grasslands allow the elk to avoid deep snow and survive the winter season. Elk feed mainly on grasses, as well as forbs, woody plants and mushrooms. When the elk mate in the late fall, males compete for harems of females and warn other males to stay away by emitting a loud bugle. Females give birth to one or two calves in the late spring.<sup>20</sup>



Desert bighorn sheep populations can be found in the Pine Valley mountains and, preferring open rocky areas where they have adapted to maneuvering over steep slopes and rock outcrops for protection from predators. These Utah natives feed opportunistically on a variety of plant material, including cacti, grasses, and other plant materials. These foods provide the bighorn sheep with internal moisture that reduces the amount of drinking water required for comfort and survival. Females give birth to one lamb in the late spring. Big horn sheep populations are not as likely to be found where growth and development occur. The primary threat to the sheep is the intrusion of annual grasses, such as cheat grass that overtakes other native vegetation, increases wildfire occurrences, and reduces foraging opportunities for larger ungulate species.<sup>21</sup>